

APPLICATION FILED MAR. 20, 1911.

5 SHEETS--SHEET 1.



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FIG. 2.



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N. FRANZEN & J. A. BECHTEL.
TEEMING CRANE.

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1,021,457.

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5 SHEETS-SHEET 3.

FIG. 3.

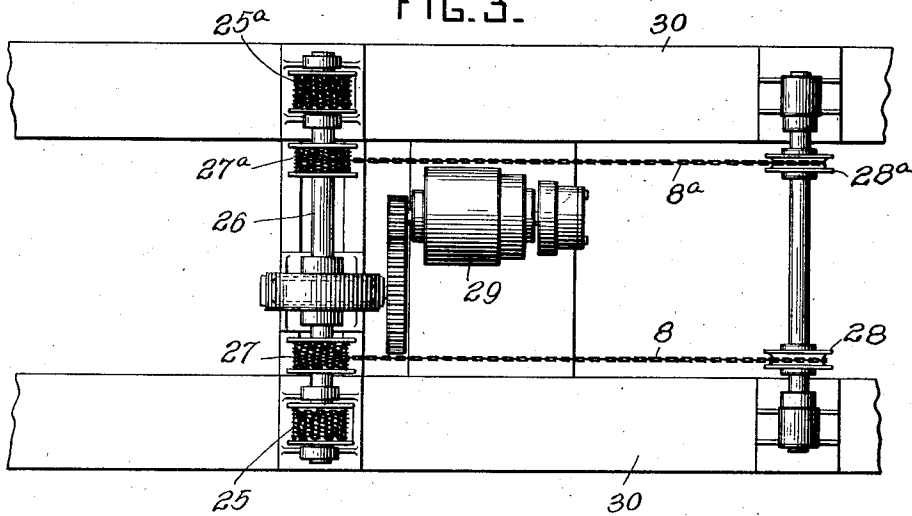
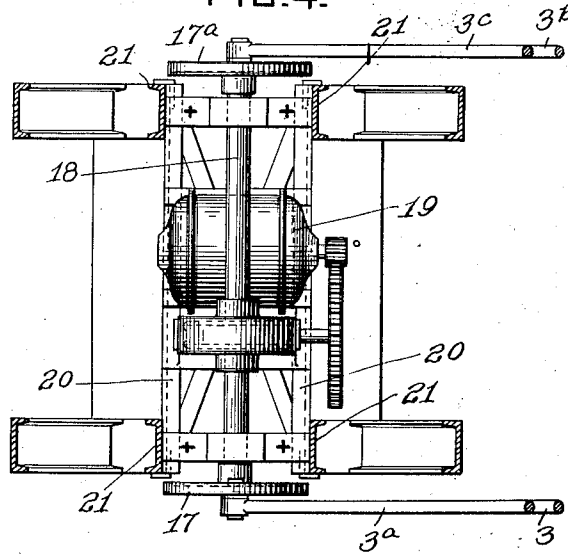


FIG. 4.



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FIG. 5.

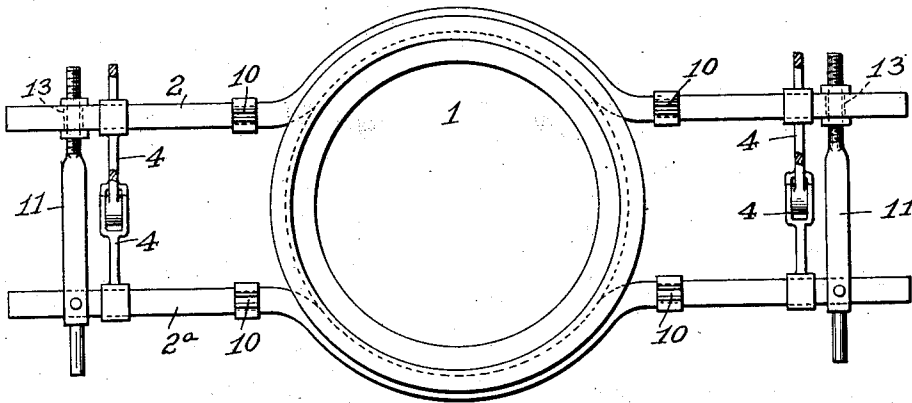
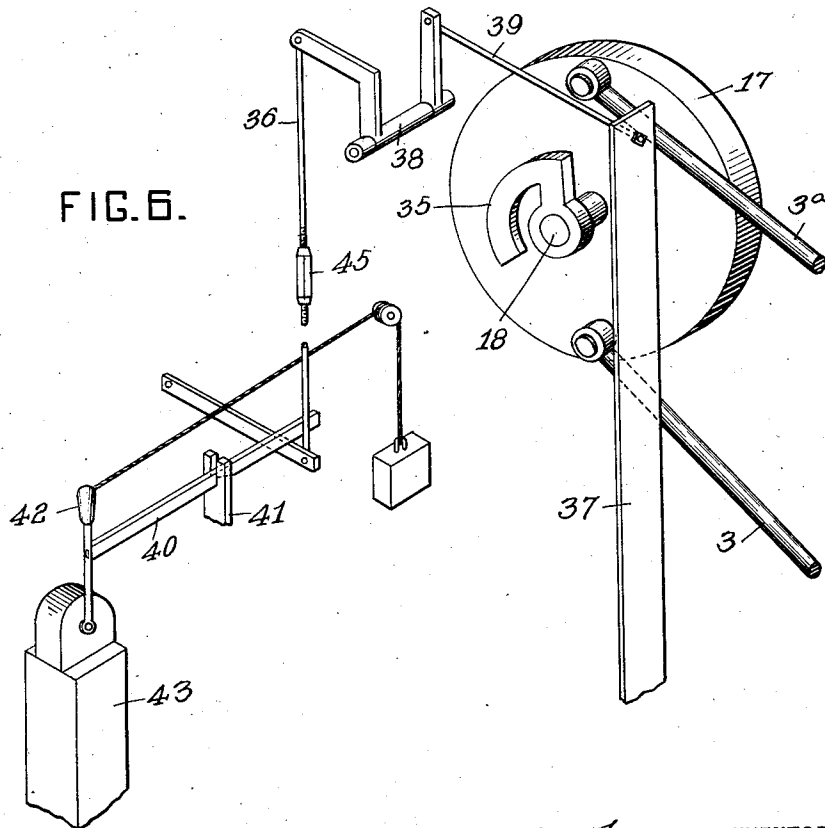


FIG. 6.



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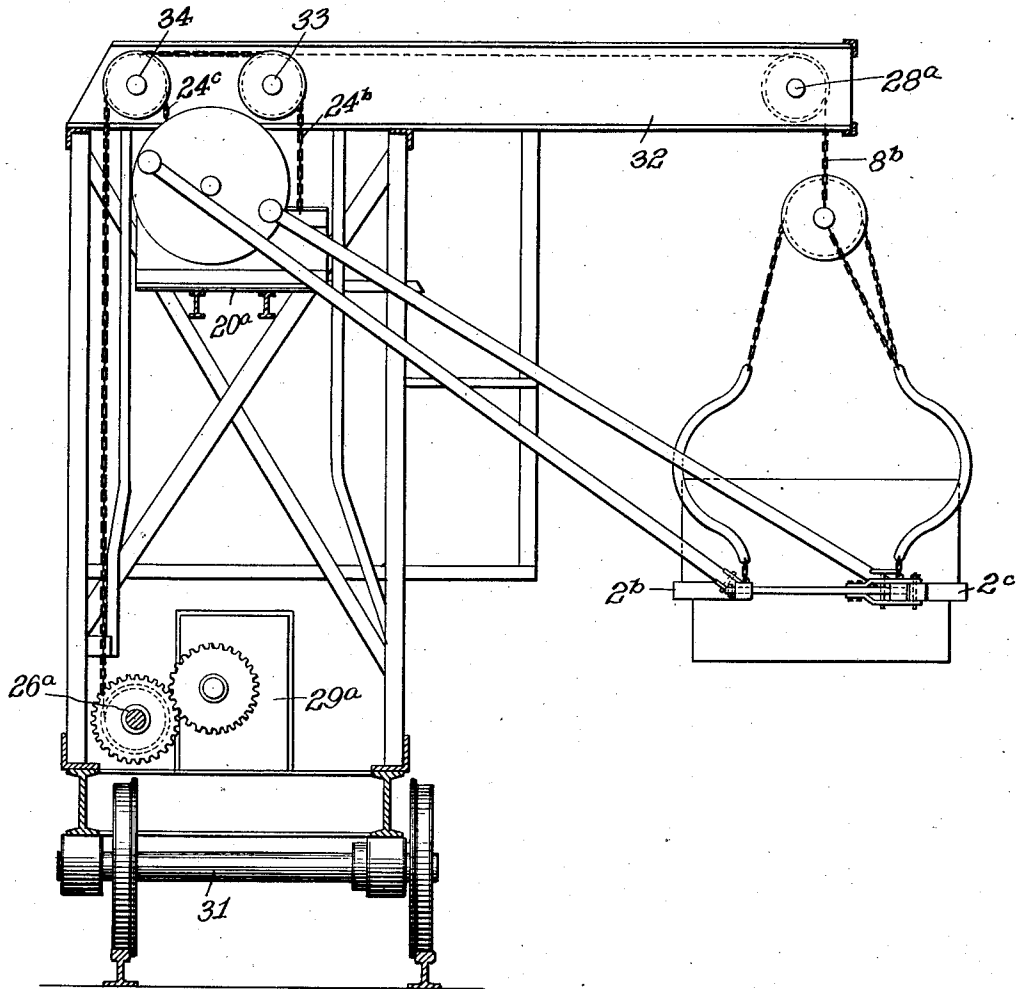
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5 SHEETS—SHEET 5.

FIG. 7.



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UNITED STATES PATENT OFFICE.

NICKLAS FRANZEN, OF FLOREFFE, AND JOHN A. BECHTEL, OF TARENTUM, PENNSYLVANIA, ASSIGNORS TO PITTSBURGH PLATE GLASS COMPANY, OF PITTSBURGH, PENNSYLVANIA, A CORPORATION OF PENNSYLVANIA.

TEEMING-CRANE.

1,021,457.

Specification of Letters Patent. Patented Mar. 26, 1912.

Application filed March 20, 1911. Serial No. 615,568.

To all whom it may concern:

Be it known that we, NICKLAS FRANZEN, of Floreffe, Allegheny county, Pennsylvania, and JOHN A. BECHTEL, residing at Tarentum, in the county of Allegheny and State of Pennsylvania, citizens of the United States, have invented or discovered certain new and useful Improvements in Teeming-Cranes, of which improvement the following is a specification.

In handling articles by cranes, derricks or devices of like character in the operation of various manufacturing plants, or at places where construction work is in progress, it sometimes becomes desirable to alter the position of the suspended load or to tip it; and, by so doing, when the load consists of a fluid substance contained in a receptacle, to pour the contents therefrom.

Our invention relates to improvements in the construction of devices that operate with the aforesaid end in view, and the object of our invention is to produce a device with increased efficiency and usefulness.

While our invention finds application in handling various articles, we choose to describe it in connection with cranes that carry pots of molten glass from furnaces to casting tables.

In the accompanying drawings, which form part of this specification, Figure 1 is a view in elevation of our teeming machine, used in connection with an overhead crane; Fig. 2 is a view in vertical section of the machine of Fig. 1, the plane of section being indicated by the line II—II, Fig. 1; Fig. 3 is a plan view of a portion of the apparatus of Fig. 1, the field of view being indicated by the line III—III, Fig. 1, and in it those parts only are shown which lie above the bottom flanges of the transverse crane girders; Fig. 4 is a view in horizontal section, taken on the line IV—IV of Fig. 1; Fig. 5 is a plan view of a pair of pot clamps holding a pot in their engagement; Fig. 6 is a perspective representation of a cut-out used in connection with the teeming mechanism; and Fig. 7 is a view in elevation of our teeming machine as applied to a cantaliver crane.

In the various figures, like parts are designated by like numerals.

Referring to Fig. 1, the glass-containing pot is indicated by the numeral 1. It is

preferably carried by a suitable supporting device, as a pair of clamps 2, 2^a. This pot-clamping device may be of any desired construction to accomplish the specific end in view. As herein shown, the clamping members 2, 2^a are preferably steel bars, shaped throughout the central portion of their extent to embrace the pot, and at their ends to extend in proximity to one another. Locking bars 11 connect the adjacent ends of the pair of clamping members when brought to pot-engaging position. Each locking bar is pivoted at one end to a pot tong, and its opposite end forms a tongue, extending, through a slot 13, formed to receive it, into the opposite clamping member. A pair of hangers 9, 9^a are swiveled at 10, 10, to the adjacent ends of a pair of clamps 2, 2^a, at each side of the pot 1; and by these hangers the pot is suspended through chains or cables from a traveling bridge or like carrier. The hangers are recessed and each pair is arranged with the recesses facing one another, to the end that the hangers will not interfere with the free turning of the pot. As illustrated, the recessing of the hangers is effected by bowing or curving them outwardly. The pot is hung immediately from a shaft 7 by a pair of cables or chains 5, 5^a, connected at their opposite ends with the upper ends of each pair of hangers and passing over sheaves 6, 6^a, which turn freely on the shaft 7; and, through shaft 7, the pot is hung mediately from the bridge 30 by a pair of chains or cables 8, 8^a. The chains 8, 8^a, pass over idlers 28, 28^a, mounted on the bridge 30, and are wound and unwound upon positively driven drums 27, 27^a, carried on the bridge 30, to raise and lower the pot, as is necessary or desired in practice.

In Fig. 1 the pot 1 is shown in full lines in normal carrying position and in dotted lines in its extreme discharge or emptying position. Tipping motion is imparted to the pot from a driven shaft, through crank-and-pitman connection. The driven shaft is indicated at 18, and it is provided with a pair of crank disks 17, 17^a. Two pairs of pitmen, 3, 3^a, and 3^b, 3^c, are pivoted at one end to one of the crank disks and at the other end to a pair of pivot points at opposite sides of the pot. Preferably, the pitmen are pivoted to the pot through the pot-carrying

tongs, and the pivoting may be either direct, as is indicated in Fig. 7, or through crank arms 4 carried by the tongs, as is indicated in Fig. 1. Whatever be the particular arrangement adopted, it will be understood that the rotating and pivoted parts are so related and adjusted as to teem the pot as well as to engage and release it. To such end the shaft 18 and the tongs are laterally disposed with relation to each other, and the pitmen extend laterally from the shaft 18 to their engagement with the pot tongs. A motor 19 drives the shaft 18 to effect tipping. As the pot 1 is mounted to be raised and lowered to meet conditions of service, so shaft 18 also with its crank disks is mounted to rise and descend, and provision is made to cause it to move vertically in unison with the pot. To this end, both shaft 18 and motor 19 are conveniently mounted on a frame 20 which is vertically movable between guides 21 borne by the bridge or carrier 30, and which is suspended by cables or chains 24, 24^a, from the bridge or carrier. These chains or cables 24, 24^a, are wound and unwound upon positively driven drums 25, 25^a; and, to the end that pot and pot-tipping mechanism shall move vertically in unison, drums 25, 25^a, are conveniently mounted on a common shaft 26, with the drums 27, 27^a, and are of equal size therewith. The shaft 26 is conveniently driven from a motor 29 borne in the carrier or bridge 30.

In Fig. 7 we have shown our teeming machine attached to a cantaliver crane and in this construction the lifting shaft 26^a, with its operating motor 29^a, may be placed immediately above the truck 31. The cantaliver beams 32 carry three shafts 28^a, 33 and 34, upon which idlers are mounted. The tong-carrying chains 8^b pass over idlers on the shafts 28^a and 34; the chains 24^b pass over idlers on the shafts 33 and 34; and the chains 24^c pass over idlers on the shaft 34. It will be understood that the rotation of the shaft 26^a will wind or unwind the chains 24^b and 24^c, from which the sliding frame 20^a is hung, as well as the chain 8^b at the same rate, which will effect a uniform raising or lowering of the sliding frame 20^a and the pot-tongs 2^b and 2^c. The further details of construction shown in Fig. 7 will be understood from the description of the disclosure in Fig. 1.

The operation of the parts thus far described will readily be understood. When a pot is to be picked up, the traveling bridge or crane is brought to position above it, the clamping apparatus is unlocked, and the crank disks 17, 17^a are turned slightly, to open the clamp permitting it to descend around the pot. The clamp is then lowered, closed, and locked; the pot lifted by the turning of shaft 26 and carried by the

bridge or carrier to the desired place. When suitably stationed above a casting table, as 22, and in front of a spreading roll, as 23, the pot will be tipped, by the means already described, to teem the glass. As teeming progresses the bridge or carrier may be moved to distribute the glass transversely of the table and longitudinally of the roll.

It will be observed on examining and comparing the machines of Figs. 1 and 7, that, whereas the machine of Fig. 1 tips the pot to the right for teeming, the machine of Fig. 7 tips the pot to the left; and it will be observed in this connection that the particular points around the periphery of the crank disk 17, at which the pitmen are connected to it, are adjusted to this end.

In the teeming operation care must be exercised to prevent the crank disks 17, 17^a, from turning too far. To guard against this we have provided a cut-out, or switch for the electric current employed to turn shaft 18. This cut-out is shown perspective in Fig. 6. The circuit-breaking is accomplished by mounting a block 35 upon the shaft 18, to the end that when the proper limit of rotation has been reached the block will strike the strip 37, which extends throughout the range of movement of the disk 17, cause the said strip to move away from the bell-crank lever 38, to which it has attachment through the rod 39. The strip 37 may be secured vertically to the carrier frame, in any desired manner familiar to those skilled in the art, to the end that it will be held normally in the position indicated in Fig. 6, but may move laterally when struck by the block 35. It will be seen that the movement of the said bell-crank lever will, through the rod 36, lift the arm 40 from its notched engagement with the support 41 and that the arm 42 of a circuit-breaker of any desired construction and indicated at 43 will move to effect a breaking of the circuit. Furthermore, to the end that an adjustment may be made for altering the limitation of tipping, the rod 36 is formed of two pieces, suitably connected for adjustment, as by a turn-buckle 45.

To the end that the pot may not move beyond its horizontal or carrying position on its return movement, we provide a limiting chain or cable 44 (see Fig. 1) at one or both ends of the shaft 6, one end of which cable is attached to the shaft 6 and the other end to the hanger that rises during the teeming operation. Fig. 1 shows the utility of the cable 44, it being taut when the pot is in a horizontal position and slack when teeming.

We do not wish to limit ourselves, in the application of our teeming machine, to the two types of cranes shown herein, or to cranes operating in plate-glass plants, for obviously many other applications of our machine may be made by those familiar

with the art without departing from the spirit of our invention.

We claim as our invention:

1. In a machine for manipulating a suspended load, the combination of a pair of tongs, a rotating member laterally disposed with relation to said tongs, a pair of pitmen, each having crank connection at one end to the said rotary member and each having pivotal connection at the other end to one member of the said tongs, substantially as described.

2. In a teeming machine, the combination of a carrier, a pot hung from said carrier by flexible suspension, a rotating shaft hung from said carrier by flexible suspension, operative connection between said shaft and said pot, for tipping the latter, and means borne by said carrier for taking up and pay-

ing out both of said flexible suspensions in unison, substantially as described.

3. In a teeming machine, the combination of a carrier, a pair of clamps sustained by said carrier, a rotating shaft laterally disposed with relation to said clamps, a pair of pitmen having crank connection at one end to said rotating shaft and at the other end each to one of said clamps, and means for locking and unlocking said clamps in fixed relative positions, substantially as described.

In testimony whereof we have hereunto set our hands.

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Witnesses:

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Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."